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HAANING, Jesper	
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tct Ser	cat His 50	aaa Lys	gtt Val	acc Thr	ctg Leu	tct Ser 55	tct Ser	tgg Trp	tat Tyr	cac His	gac Asp 60	cgc Arg	ggt Gly	tgg Trp	gct Ala	192
aaa Lys 65	atċ Ile	tct Ser	aac Asn	atg Met	acc Thr 70	ctg Leu	tct Ser	aac Asn	ggt Gly	aaa Lys 75	ctg Leu	aga Arg	gtt Val	aac Asn	cag Gln 80	240
gac Asp	ggt Gly	ttc Phe	tac Tyr	tac Tyr 85	ctg Leu	tac Tyr	gċt Ala	aac Asn	atc Ile 90	tgt Cys	ttc Phe	aga Arg	cat His	cac His 95	gaa Glu	2,88
acc Thr	tct Ser	ggt Gly	tct Ser 100	gtt Val	cca Pro	acc Thr	gac Asp	tac Tyr 105	ctg Leu	cag Gln	ctg Leu	atg Met	gtt Val 110	tac Tyr	gtt Val	336
gtt Val	aaa Lys	acc Thr 115	tct Ser	atc Ile	aaa Lys	atc Ile	cca Pro 120	tct Ser	tca Ser	cat His	aac Asn	ctg Leu 125	atg Met	aaa Lys	ggt Gly	384
ggt Gly	tct Ser 130	acc Thr	aaa Lys	aac Asn	tgg Trp	tct Ser 135	ggt Gly	aac Asn	tct Ser	gaa Glu	ttc Phe 140	cat His	ttc Phe	tac Tyr	tct Ser	432
atc Ile 145	aac Asn	gtt Val	ggt Gly	ggt Gly	ttc Phe 150	ttc Phe	aaa Lys	ctg Leu	aga Arg	gct Ala 155	ggt Gly	gaa Glu	gaa Glu	atc Ile	tct Ser 160	480
atc Ile	cag Gln	gtt Val	tct Ser	aac Asn 165	cct Pro	tct Ser	ctg Leu	ctg Leu	gac Asp 170	cca Pro	gac Asp	cag Gln	gac Asp	gct Ala 175	acc Thr	528
tac Tyr	ttc Phe	Gly aaa	gcc Ala 180	ttc Phe	aaa Lys	gtt Val	cag Gln	gac Asp 185	atc Ile	gac Asp	tag					564

<211> 187

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: Synthetic PCR product with optimum codons for E. coli and P. pastoris expression

<400> 8

Glu Leu Gly Ser Leu Glu Lys Arg Glu Ala Glu Ala His Val Met Lys

1 5 10 15

His Gln His Gln His Gln His Gln His Gln His Gln Lys Pro Glu Ala 20 25 30

Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro Ser Gly
35 40 45

Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly Trp Ala
50 55 60

Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val Asn Gln 65 70 75 80

Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His His Glu 85 90 95

Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val Tyr Val

Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met Lys Gly
115 120 125

Gly Ser Thr Lys Asn Trp Ser Gly Asn Ser Glu Phe His Phe Tyr Ser 130 135 140

Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu Ile Ser 145 150 155 160

Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp Ala Thr 165 170 175

Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp 180 185

<210> 9

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: DNA encoding
 murine OPGL, residues 158-316, fused to His tag

<220>

<221> CDS

<222> (1)..(519)

<220>

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<221> misc_binding
<222> (1)..(42)
<223> His tag
<220>
<221> misc feature
<222> (43)..(519)
<223> Murine OPGL, residues 158-316
<400> 9
atg aaa cac caa cac caa cat caa cat caa cat caa aaa cct
Met Lys His Gln His Gln His Gln His Gln His Gln Lys Pro
                                     10
gaa get cag eca tte get cat etg ace ate aac get gea teg ate eet
                                                                  96
Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro
         20
tot ggt tot cat aaa gtt acc ctg tot tot tgg tat cac gac cgc ggt
                                                                  144
Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
                             40
         35
tgg gct aaa atc tct aac atg acc ctg tct aac ggt aaa ctg aga gtt
                                                                  192
Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val
                         55
     50
aac cag gac ggt ttc tac tac ctg tac gct aac atc tgt ttc aga cat
Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His
 65
cac gaa acc tct ggt tct gtt cca acc gac tac ctg cag ctg atg gtt
His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val
                                     90
                 85
tac gtt gtt aaa acc tct atc aaa atc cca tct tca cat aac ctg atg
Tyr Val Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met
                                105
            100
aaa ggt ggt tot acc aaa aac tgg tot ggt aac tot gaa tto cat tto
Lys Gly Gly Ser Thr Lys Asn Trp Ser Gly Asn Ser Glu Phe His Phe
        115
tac tot atc aac gtt ggt ggt ttc ttc aaa ctg aga gct ggt gaa gaa
Tyr Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu
                        135
    130
ate tet ate cag gtt tet aac eet tet etg etg gae eea gae cag gae
Ile Ser Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp
                                        155
                    150
145
                                                                  519
get acc tac ttc ggg gcc ttc aaa gtt cag gac atc gac
Ala Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp
                165
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<211> 173

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: DNA encoding murine OPGL, residues 158-316, fused to His tag

<400> 10

Met Lys His Gln His Gln His Gln His Gln His Gln His Gln Lys Pro

1 5 10 15

Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro 20 25 30

Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
35 40 45

Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val
50 55 60

Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His 65 70 75 80

His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val 85 90 95

Tyr Val Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met 100 105 110

Lys Gly Gly Ser Thr Lys Asn Trp Ser Gly Asn Ser Glu Phe His Phe 115 120 125

Tyr Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu 130 135 140

Ile Ser Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp 145 150 155 160

Ala Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp 165 170

<210> 11

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Fusion of murine OPGL, residues 158-316 with C to S mutation, and His tag

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<220>
<221> CDS
<222> (1)..(519)
<220>
<221> misc_binding
<222> (1)..(42)
<223> His tag
<220>
<221> misc feature
<222> (43)..(228)
<223> Murine OPGL, residues 158-219
<220>
<221> misc_feature
<222> (232)..(519)
<223> Murine OPGL, residues 221-316
<220>
<221> mutation
<222> (229)..(231)
<223> tgt (Cys) to tcc (Ser)
<220>
<400> 11
atg aaa cac caa cac caa cat caa cat caa cat caa cat caa aaa cct
Met Lys His Gln His Gln His Gln His Gln His Gln His Gln Lys Pro
                                     10
gaa gct cag cca ttc gct cat ctg acc atc aac gct gca tcg atc cct
Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro
                                 25
                                                                   144
tot ggt tot cat aaa gtt acc ctg tot tot tgg tat cac gac cgc ggt
Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
                             40
tgg gct aaa atc tct aac atg acc ctg tct aac ggt aaa ctg aga gtt
                                                                   192
Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val
                         55
aac cag gac ggt ttc tac tac ctg tac gct aac atc tcc ttc aga cat
Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Ser Phe Arg His
cac gaa acc tot ggt tot gtt cca acc gac tac ctg cag ctg atg gtt
                                                                   288
His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val
                 85
                                      90
```

tac Tyr	gtt Val	gtt Val	aaa Lys 100	acc Thr	tct Ser	atc Ile	aaa Lys	atc Ile 105	cca Pro	tct Ser	tca Ser	cat His	aac Asn 110	ctg Leu	atg Met
aaa Lys	ggt Gly	ggt Gly 115	tct Ser	acc Thr	aaa Lys	aac Asn	tgg Trp 120	tct Ser	ggt Gly	aac Asn	tct Ser	gaa Glu 125	ttc Phe	cat His	ttc Phe
tac Tyr	tct Ser 130	atc Ile	aac Asn	gtt Val	ggt Gly	ggt Gly 135	ttc Phe	ttc Phe	aaa Lys	ctg Leu	aga Arg 140	gct Ala	ggt Gly	gaa Glu	gaa Glu
atc Ile 145	tct Ser	atc Ile	cag Gln	gtt Val	tct Ser 150	aac Asn	cct Pro	tct Ser	ctg Leu	ctg Leu 155	gac Asp	cca Pro	gac Asp	cag Gln	gac Asp 160
gct Ala	acc Thr	tac Tyr	ttc Phe	999 Gly 165	gcc Ala	ttc Phe	aaa Lys	gtt Val	cag Gln 170	gac Asp	atc Ile	gac Asp			
<21 <21 <21	0 > 12 1 > 1' 2 > Pi 3 > A: 3 > De	73 RT rtif escr	ipti	on o	E Art	cifi	cial	Seq	ienc	e:	Fusi	on o	£		
		urin						-316	wit]	h C	to S				
<40 Met	m 0> 1 Lys	utat 2	ion,	an	d Hi	s tag	3					His	Gln	Lys 15	Pro
Met 1	m 0> 1 Lys	utat 2 His	ion, Gln	and His	d His	s tag	g Gln	His	Gln 10	His	Gln			Ile	Pro Pro
Met 1 Glu	m 0> 1 Lys Ala	utat 2 His Gln	Gln Pro 20 His	and His 5 Phe	d His	His	g Gln Leu	His Thr 25	Gln 10	His Asn	Gln	Ala	Ser 30	Ile	
Met 1 Glu Ser	mo 0> 1 Lys Ala Gly	utat 2 His Gln Ser 35	Gln Pro 20 His	His 5 Phe Lys	d Hi: Gln Ala Val	His His Thr	Gln Leu Leu 40 Thr	His Thr 25 Ser	Gln 10 Ile Ser	His Asn Trp	Gln Ala Tyr	Ala His 45	Ser 30 Asp	Ile Arg	Pro
Met 1 Glu Ser	O> 1: Lys Ala Gly Ala 50	utat 2 His Gln Ser 35	Gln Pro 20 His	His 5 Phe Lys	Gln Ala Val	His His Thr Met 55	Gln Leu Leu 40 Thr	His Thr 25 Ser	Gln 10 Ile Ser	His Asn Trp	Gln Ala Tyr Gly 60	Ala His 45	Ser 30 Asp	Ile Arg	Pro
Met 1 Glu Ser Trp	O> 1: Lys Ala Gly Ala 50	utat 2 His Gln Ser 35 Lys	Gln Pro 20 His	His 5 Phe Lys	Gln Ala Val Asn Tyr 70 Ser	His His Thr Met 55	Gln Leu Leu 40 Thr	His Thr 25 Ser Leu	Gln 10 Ile Ser Ser	His Asn Trp Asn 75	Gln Ala Tyr Gly 60	Ala His 45 Lys	Ser 30 Asp Leu	Ile Arg Arg	Gly Val His 80
Met 1 Glu Ser Trp Asn 65	O> 1. Lys Ala Gly Ala 50 Gln	utat  2  His  Gln  Ser  35  Lys  Asp	Gln Pro 20 His Ile	His 5 Phe Lys Ser Phe Gly 85	Gln Ala Val Asn Tyr 70 Ser	His His Thr Met 55 Tyr	Gln Leu Leu 40 Thr	His Thr 25 Ser Leu Tyr	Gln 10 Ile Ser Ala Asp 90	Asn Trp Asn 75	Gln Ala Tyr Gly 60 Ile	Ala His 45 Lys Ser	Ser 30 Asp Leu	Ile Arg Arg Arg	Gly Val His 80

Tyr Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu

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Ile Ser Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp
                   150
                                       155
Ala Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp
              165
<210> 13
<211> 564
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: Fusion of
      murine OPGL, residues 158-316 modified by
      introduction of tetanus toxoid P30 epitope, and
      His tag
<220>
<221> CDS
<222> (1)..(564)
<220>
<221> misc_binding
<222> (1)..(42)
<223> His tag
<220>
<221> misc_feature
<222> (43)..(336)
<223> Murine OPGL, residues 158-255
<220>
<221> misc_feature
<222> (337)..(399)
<223> Tetanus toxoid P30 epitope
<220>
<221> misc_feature
<222> (400)..(564)
<223> Murine OPGL, residues 262-316
<400> 13
atg aaa cac caa cat caa cat caa cat caa cat caa aaa cct
Met Lys His Gln His Gln His Gln His Gln His Gln Lys Pro
                                     10
```

gaa Glu	gct Ala	cag Gln	cca Pro 20	ttc Phe	gct Ala	cat His	ctg Leu	acc Thr 25	atc Ile	aac Asn	gct Ala	gca Ala	tcg Ser 30	atc Ile	cct Pro	96
tct Ser	ggt Gly	tct Ser 35	cat His	aaa Lys	gtt Val	acc Thr	ctg Leu 40	tct Ser	tct Ser	tgg Trp	tat Tyr	cac His 45	gac Asp	cgc Arg	ggt Gly	144
tgg Trp	gct Ala 50	aaa Lys	atc Ile	tct Ser	aac Asn	atg Met 55	acc Thr	ctg Leu	tct Ser	aac Asn	ggt Gly 60	aaa Lys	ctg Leu	aga Arg	gtt Val	192
aac Asn 65	cag Gln	gac Asp	ggt Gly	ttc Phe	tac Tyr 70	tac Tyr	ctg Leu	tac Tyr	gct Ala	aac Asn 75	atc Ile	tgt Cys	ttc Phe	aga Arg	cat His 80	240
cac His	gaa Glu	acc Thr	tct Ser	ggt Gly 85	tct Ser	gtt Val	cca Pro	acc Thr	gac Asp 90	tac Tyr	ctg Leu	cag Gln	ctg Leu	atg Met 95	gtt Val	288
tac Tyr	gtt Val	gtt Val	aaa Lys 100	acc Thr	tct Ser	atc Ile	aaa Lys	atc Ile 105	cca Pro	tct Ser	tca Ser	cat His	aac Asn 110	ctg Leu	atg Met	336
ttc Phe	aac Asn	aac Asn 115	ttc Phe	acc Thr	gtt Val	tct Ser	ttc Phe 120	tgg Trp	ctg Leu	agg Arg	gta Val	ccg Pro 125	aaa Lys	gtt Val	tct Ser	384
gct Ala	tct Ser 130	cac His	ctg Leu	gaa Glu	aac Asn	tgg Trp 135	tct Ser	ggt Gly	aac Asn	tct Ser	gaa Glu 140	ttc Phe	cat His	ttc Phe	tac Tyr	432
tct Ser 145	atc Ile	aac Asn	gtt Val	ggt Gly	ggt Gly 150	ttc Phe	ttc Phe	aaa Lys	ctg Leu	aga Arg 155	gct Ala	ggt Gly	gaa Glu	gaa Glu	atc Ile 160	480
tct Ser	atc Ile	cag Gln	gtt Val	tct Ser 165	aac Asn	cct Pro	tct Ser	ctg Leu	ctg Leu 170	gac Asp	cca Pro	gac Asp	cag Gln	gac Asp 175	gct Ala	528
acc Thr	tac Tyr	ttc Phe	999 Gly 180	gcc Ala	ttc Phe	aaa Lys	gtt Val	cag Gln 185	gac Asp	atc Ile	gac Asp					564

<211> 188

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: Fusion of murine OPGL, residues 158-316 modified by introduction of tetanus toxoid P30 epitope, and His tag

<400> 14

Met Lys His Gln His Gln His Gln His Gln His Gln His Gln Lys Pro 1 5 10 15

Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro 20 25 30

Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
35 40 45

Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val
50 55 60

Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His 65 70 75 80

His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val 85 90 95

Tyr Val Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met 100 105 110

Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser

Ala Ser His Leu Glu Asn Trp Ser Gly Asn Ser Glu Phe His Phe Tyr
130 135 140

Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu Ile 145 150 155 160

Ser Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp Ala 165 170 175

Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp 180 185

<210> 15

<211> 546

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Fusion between murine OPGL, residues 158-316 with tetanus toxoid P2 epitope introduced, and His tag

<220>

<221> CDS

<222> (1)..(546)

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<220>
<221> misc binding
<222> (1)..(42)
<223> His tag
<220>
<221> misc_feature
<222> (43)..(336)
<223> Murine OPGL, residues 158-255
<220>
<221> misc_feature
<222> (382)..(546)
<223> Murine OPGL, residues 262-316
<220>
<221> misc feature
<222> (337)..(381)
<223> Tetanus toxoid P2 epitope
atg aaa cac caa cac caa cat caa cat caa cat caa cat caa aaa cct
                                                                 48
Met Lys His Gln His Gln His Gln His Gln His Gln His Gln Lys Pro
            5 --- 10
gaa gct cag cca ttc gct cat ctg acc atc aac gct gca tcg atc cct
                                                                 96
Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro
            20
tot ggt tot cat aaa gtt acc ctg tot tot tgg tat cac gac cgc ggt
Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
                            40
tgg gct aaa atc tct aac atg acc ctg tct aac ggt aaa ctg aga gtt
                                                                 192
Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val
                         55
aac cag gac ggt ttc tac tac ctg tac gct aac atc tgt ttc aga cat
Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His
                     70
cac gaa acc tot ggt tot gtt coa acc gac tac ctg cag ctg atg gtt
                                                                 288
His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val
                                    90
tac gtt gtt aaa acc cct atc aaa atc caa tct tca cat aac ctg atg
                                                                 336
Tyr Val Val Lys Thr Pro Ile Lys Ile Gln Ser Ser His Asn Leu Met
                               105
            100
cag tac atc aaa gct aat tcg aaa ttc atc ggt atc acc gaa ctg aac
Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu Asn
```

115

tgg Trp	tct Ser 130	ggt Gly	aac Asn	tct Ser	gaa Glu	ttc Phe 135	cat His	ttc Phe	tac Tyr	tct Ser	atc Ile 140	aac Asn	gtt Val	ggt Gly	ggt Gly	432
ttc Phe 145	ttc Phe	aaa Lys	ctg Leu	aga Arg	gct Ala 150	ggt Gly	gaa Glu	gaa Glu	atc Ile	tct Ser 155	atc Ile	cag Gln	gtt Val	tct Ser	aac Asn 160	480
cct Pro	tct Ser	ctg Leu	ctg Leu	gac Asp 165	cca Pro	gac Asp	cag Gln	gac Asp	gct Ala 170	acc Thr	tac Tyr	ttc Phe	Gly 999	gcc Ala 175	ttc Phe	528
	_	cag Gln		_												546
<21 <21 <21	3 > De be	32 RT rtif: escr: etwe	ipti en m	on o	quend f Art e OPC tope	cifi GL, :	resi	dues	158	-316	wit:	h te	tanu	s		
<40 Met		6 His	Gln	His 5	Gln	His	Gln	His	Gln 10	His	Gln	His	Gln	Lys 15	Pro	
Glu	Ala	Gln	Pro 20	Phe	Ala	His	Leu	Thr 25	Ile	Asn	Ala	Ala	Ser 30	Ile	Pro	
Ser	Gly	Ser 35	His	Lys	Val	Thr	Leu 40	Ser	Ser	Trp	Tyr	His 45	Asp	Arg	Gly	
Trp	Ala 50		Ile	Ser	Asn	Met 55		Leu	Ser	Asn	Gly 60	Lys	Leu	Arg	Val	
65					70					75					His 80	
His	Glu	Thr	Ser	Gly 85	Ser	Val	Pro	Thr	Asp 90		Leu	Gln	. Leu	Met 95	Val	
Tyr	· Val	Val	Lys 100		Pro	Ile	. Lys	11e		Ser	Ser	His	Asr 110	Leu	Met	
_										<b>~</b> 1	. тла	Th-		T	-	
Gln	Tyr	Ile 115		Ala	. Asn	. Ser	120		: Ile	. СТУ	ire	125	GIC	ı Leu	Asn	

Phe Phe Lys Leu Arg Ala Gly Glu Glu Ile Ser Ile Gln Val Ser Asn 155 145 150 Pro Ser Leu Leu Asp Pro Asp Gln Asp Ala Thr Tyr Phe Gly Ala Phe 170 Lys Val Gln Asp Ile Asp 180 <210> 17 <211> 519 <212> DNA <213> Artificial Sequence <223> Description of Artificial Sequence: Fusion between murine OPGL, residues 158-316 with tetanus toxoid P2 epitope introduced, and His tag <220> <221> CDS <2225 (1)..(519) <220> <221> misc\_binding <222> (1)..(42) <223> His tag <220> <221> misc\_feature <222> (43)..(432) <223> Murine OPGL, residues 158-287 <220> <221> misc\_feature <222> (478)..(519) <223> Murine OPGL, residues 303-316 <220> <221> misc feature <222> (433)..(477) <223> Tetanus toxoid P2 epitope atg aaa cac caa cac caa cat caa cat caa cat caa cat caa aaa cct Met Lys His Gln His Gln His Gln His Gln His Gln Lys Pro 1

gaa gct cag cca ttc gct cat ctg acc atc aac gct gca tcg atc cct Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro

20

tct Ser	ggt Gly	tct Ser 35	cat His	aaa Lys	gtt Val	acc Thr	ctg Leu 40	tct Ser	tct Ser	tgg Trp	tat Tyr	cac His 45	gac Asp	cgc Arg	ggt Gly	144
tgg Trp	gct Ala 50	aaa Lys	atc Ile	tct Ser	aac Asn	atg Met 55	acc Thr	ctg Leu	tct Ser	aac Asn	ggt Gly 60	aaa Lys	ctg Leu	aga Arg	gtt Val	192
aac Asn 65	cag Gln	gac Asp	ggt Gly	ttc Phe	tac Tyr 70	tac Tyr	ctg Leu	tac Tyr	gct Ala	aac Asn 75	atc Ile	tgt Cys	ttc Phe	aga Arg	cat His 80	240
cac His	gaa Glu	acc Thr	tct Ser	ggt Gly 85	tct Ser	gtt Val	cca Pro	acc Thr	gac Asp 90	tac Tyr	ctg Leu	cag Gln	ctg Leu	atg Met 95	gtt Val	288
tac Tyr	gtt Val	gtit Val	aaa Lys 100	acc Thr	tct Ser	atc Ile	aaa Lys	atc Ile 105	cca Pro	tct Ser	tca Ser	cat His	aac Asn 110	ctg Leu	atg Met	336
aaa Lys	ggt Gly	ggt Gly 115	tct Ser	acc Thr	aaa Lys	aac Asn	tgg Trp 120	tct Ser	ggt Gly	aac Asn	tct Ser	gaa Glu 125	ttc Phe	cat His	ttc Phe	384
tac Tyr	tct Ser 130	atc Ile	aac Asn	gtt Val	ggt Gly	ggt Gly 135	ttc Phe	ttc Phe	aaa Lys	ctg Leu	aga Arg 140	gct Ala	ggt Gly	gaa Glu	gaa Glu	432
cag Gln 145	tac Tyr	atc Ile	aaa Lys	gct Ala	aat Asn 150	tcg Ser	aaa Lys	ttc Phe	atc Ile	ggt Gly 155	atc Ile	acc Thr	gaa Glu	ctg Leu	gac Asp 160	480
gct Ala	acc Thr	tac Tyr	ttc Phe	999 Gly 165	gcc Ala	ttc Phe	aaa Lys	gtt Val	cag Gln 170	gac Asp	atc Ile	gac Asp				519
<21 <21 <21	<210> 18 <211> 173 <212> PRT <213> Artificial Sequence <223> Description of Artificial Sequence: Fusion between     murine OPGL, residues 158-316 with tetanus toxoid     P2 epitope introduced, and His tag															
<40 Met		8 His	: Gln	His		His	: Glr	. His	Glr 10	· His	Glr	n His	Glr	1 Lys	s Pro	
Glu	. Ala	Glr	Pro 20		: Ala	His	Lev	Thr 25		. Asr	n Ala	a Ala	s Ser	r Ile	e Pro	

Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly

40 45

Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val

26

Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Arg His 65 70 75 80

His Glu Thr Ser Gly Ser Val Pro Thr Asp Tyr Leu Gln Leu Met Val 85 90 95

Tyr Val Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met 100 105 110

Lys Gly Gly Ser Thr Lys Asn Trp Ser Gly Asn Ser Glu Phe His Phe 115 120 125

Tyr Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu

Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu Asp 145 150 155 160

Ala Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp

<210> 19

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Fusion between murine OPGL, residues 158-316 with tetanus toxoid P30 epitope introduced, and His tag

<220>

<221> CDS

<222> (1)..(519)

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<221> misc\_binding

<222> (1)..(42)

<223> His tag

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<221> misc\_feature

<222> (43)..(231)

<223> Murine OPGL, residues 158-220

<220>

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<211> 173

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: Fusion between
 murine OPGL, residues 158-316 with tetanus toxoid
 P30 epitope introduced, and His tag

<400> 20

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Glu Ala Gln Pro Phe Ala His Leu Thr Ile Asn Ala Ala Ser Ile Pro 20 25 30

Ser Gly Ser His Lys Val Thr Leu Ser Ser Trp Tyr His Asp Arg Gly
35 40 45

Trp Ala Lys Ile Ser Asn Met Thr Leu Ser Asn Gly Lys Leu Arg Val

Asn Gln Asp Gly Phe Tyr Tyr Leu Tyr Ala Asn Ile Cys Phe Asn Asn 65 70 75 80

Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser Ala Ser His 85 90 95

Leu Glu Val Lys Thr Ser Ile Lys Ile Pro Ser Ser His Asn Leu Met 100 105 110

Lys Gly Gly Ser Thr Lys Asn Trp Ser Gly Asn Ser Glu Phe His Phe 115 120 125

Tyr Ser Ile Asn Val Gly Gly Phe Phe Lys Leu Arg Ala Gly Glu Glu

Ile Ser Ile Gln Val Ser Asn Pro Ser Leu Leu Asp Pro Asp Gln Asp 145 150 155 160

Ala Thr Tyr Phe Gly Ala Phe Lys Val Gln Asp Ile Asp 165 170

<210> 21

<211> 68

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic PCR primer

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  <213> Artificial Sequence
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       primer
  <400> 22
                                                                 24
  ctcatctgac catcaacgct gcat
  <210> 23
  <211> 64
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       primer
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  gtag
  <210> 24
  <211> 61
  <212> DNA
  <213> Artificial Sequence
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  <210> 25
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  <213> Artificial Sequence
  <220>
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<210> 29 <211> 49 <212> DNA

<213> Artificial Sequence

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             <212> DNA
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                                                                 26
cttactagtc gatgtcctga actttg
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aagatgggat tttg
<210> 33
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10

5

<212> PRT <213> Clostridium tetani

Ala Ser His Leu Glu 20